(ii) The information obtained under paragraphs (b)(2), (b)(3), and (c) of this section; and

(iii) Geologic literature and practices.

(2) For any portion of a permit area in which the strata down to the coal seam to be mined will be removed or are already exposed, samples shall be collected and analyzed from test borings; drill cores; or fresh, unweathered, uncontaminated samples from rock outcrops down to and including the deeper of either the stratum immediately below the lowest coal seam to be mined or any aquifer below the lowest coal seam to be mined which may be adversely impacted by mining. The analyses shall result in the following:

(i) Logs showing the lithologic characteristics including physical properties and thickness of each stratum and location of ground water where occurring;

(ii) Chemical analyses identifying those strata that may contain acid- or toxic-forming, or alkalinity-producing materials and to determine their content except that the regulatory authority may find that the analysis for alkalinity-producing material is unnecessary; and

(iii) Chemical analysis of the coal seam for acid- or toxic-forming materials, including the total sulfur and pyritic sulfur, except that the regulatory authority may find that the analysis of pyritic sulfur content is unnecessary.

(3) For lands within the permit and adjacent areas where the strata above the coal seam to be mined will not be removed, samples shall be collected and analyzed from test borings or drill cores to provide the following data:

(i) Logs of drill holes showing the lithologic characteristics, including physical properties and thickness of each stratum that may be impacted, and location of ground water where occurring;

(ii) Chemical analyses for acid- or toxic-forming or alkalinity-producing materials and their content in the strata immediately above and below the coal seam to be mined;

(iii) Chemical analyses of the coal seam for acid- or toxic-forming materials, including the total sulfur and pyritic sulfur, except that the regulatory authority may find that the analysis of pyrite sulfur content is unnecessary; and

(iv) For standard room and pillar mining operations, the thickness and engineering properties of clays or soft rock such as clay shale, if any, in the stratum immediately above and below each coal seam to be mined.

(c) If determined to be necessary to protect the hydrologic balance, to minimize or prevent subsidence, or to meet the performance standards of this chapter, the regulatory authority may require the collection, analysis and description of geologic information in addition to that required by paragraph (b) of this section.

(d) An applicant may request the regulatory authority to waive in whole or in part the requirements of paragraphs (b) (2) and (3) of this section. The waiver may be granted only if the regulatory authority finds in writing that the collection and analysis of such data is unnecessary because other information having equal value or effect is available to the regulatory authority in a satisfactory form.

[48 FR 43989, Sept. 26, 1983]

§ 784.23 Operation plan: Maps and plans.

Each application shall contain maps and plans as follows:

(a) The maps, plans and cross-sections shall show the underground mining activities to be conducted, the lands to be affected throughout the operation, and any change in a facility or feature to be caused by the proposed operations, if the facility or feature was shown under 30 CFR 783.24 and 783.25.

(b) The following shall be shown for the proposed permit area:

(1) Buildings, utility corridors, and facilities to be used;

(2) The area of land to be affected within the proposed permit area, according to the sequence of mining and reclamation;

(3) Each area of land for which a performance bond or other equivalent guarantee will be posted under subchapter J of this chapter;

(4) Each coal storage, cleaning and loading area;

(5) Each topsoil, spoil, coal preparation waste, underground development waste, and non-coal waste storage area;

(6) Each water diversion, collection, conveyance, treatment, storage and discharge facility to be used;

(7) Each source of waste and each waste disposal facility relating to coal processing or pollution control;

(8) Each facility to be used to protect and enhance fish and wildlife related environmental values;

(9) Each explosive storage and handling facility;

(10) Location of each sedimentation pond, permanent water impoundment, coal processing waste bank, and coal processing waste dam and embankment, in accordance with 30 CFR 784.16 and disposal areas for underground development waste and excess spoil, in accordance with 30 CFR 784.19;

(11) Each profile, at cross-sections specified by the regulatory authority, of the anticipated final surface configuration to be achieved for the affected areas;

(12) Location of each water and subsidence monitoring point;

(13) Location of each facility that will remain on the proposed permit area as a permanent feature, after the completion of underground mining activities.

(c) Except as provided in §§ 784.16(a)(2), 784.16(a)(3), 784.19, 817.71(b), 817.73(c), 817.74(c) and 817.81(c) of this chapter, cross sections, maps and plans required under paragraphs (b)(4), (5), (6), (10) and (11) of this section shall be prepared by, or under the direction of, and certified by a qualified, registered, professional engineer, a professional geologist, or in any State which authorizes land surveyors to prepare and certify such cross sections, maps and plans, a qualified, registered, professional, land surveyor, with assistance from experts in related fields such as landscape architecture.

[44 FR 15366, Mar. 13, 1979; 44 FR 49686, Aug. 24, 1979, as amended at 45 FR 51550, Aug. 4, 1980; 48 FR 14822, Apr. 5, 1983; 50 FR 16199, Apr. 24, 1985; 56 FR 65635, Dec. 17, 1991]

§ 784.24 Road systems.

(a) *Plans and drawings.* Each applicant for an underground coal mining and reclamation permit shall submit plans and drawings for each road, as defined in § 701.5 of this chapter, to be constructed, used, or maintained within the proposed permit area. The plans and drawings shall—

(1) Include a map, appropriate cross sections, design drawings, and specifications for road widths, gradients, surfacing materials, cuts, fill embankments, culverts, bridges, drainage ditches, low-water crossings, and drainage structures;

(2) Contain the drawings and specifications of each proposed road that is located in the channel of an intermittent or perennial stream, as necessary for approval of the road by the regulatory authority in accordance with § 817.150(d)(1) of this chapter;

(3) Contain the drawings and specifications for each proposed ford of perennial or intermittent streams that is used as a temporary route, as necessary for approval of the ford by the regulatory authority in accordance with § 817.151(c)(2) of this chapter;

(4) Contain a description of measures to be taken to obtain approval of the regulatory authority for alteration or relocation of a natural stream channel under § 817.151(d)(5) of this chapter;

(5) Contain the drawings and specifications for each low-water crossing of perennial or intermittent stream channels so that the regualtory authority can maximize the protection of the stream in accordance with § 817.151(d)(6) of this chapter; and

(6) Describe the plans to remove and reclaim each road that would not be retained under an approved postmining land use, and the schedule for this removal and reclamation.

(b) *Primary road certification.* The plans and drawings for each primary road shall be prepared by, or under the direction of, and certified by a qualified registered professional engineer, or in any State which authorizes land surveyors to certify the design of primary roads a qualified registered professional land surveyor, experienced in the design and construction of roads, as meeting the requirements of this chapter; current, prudent engineering practices; and any design criteria established by the regulatory authority.